

Dr. Marx stated that he had received a new *Hypochilus* from Colorado, sent by Mr. Titus Ulke.

Mr. Ashmead read the following paper :

NOTES ON THE GENUS MELITTOBIA.

BY WM. H. ASHMEAD.

The genus *Melittobia*, in "Cresson's Synopsis," is stated to have been erected by Prof. Westwood, in the Proceedings of the London Entomological Society for 1849, but in looking up the subject I find it was established two years earlier. In the same publication for the year 1847, page xviii, is the following brief note relating to it : Mr. Westwood exhibited specimens of a minute but very remarkable Hymenopterous parasite belonging to the family Chalcididæ, reared by the late M. Victor Audouin, in the nests of mason bees, near Paris, in which the antennæ of the males are singularly distorted and the wings almost rudimental, thus offering a strikingly opposite analogy to other bee parasites, such as *Stylops*, *Melæ*, and *Sitaris*. Mr. Westwood proposed for this insect the name of *Melittobia Audouinii*. About two years later Mr. George Newport, in one of his celebrated biological contributions, "The Anatomy and Development of certain Chalcididæ and Ichneumonidæ," read before the Linnæan Society of London, March 20, 1849, described what is evidently the same thing under the name *Anthophorabia retusæ* reared from the cells of *Anthophora retusa*, found in a dry clay bank beneath the ruins of the Roman Castle at Richborough, near Sandwich in Kent. In a notice of this memoir, Prof. Westwood, in the Proceedings of the London Entomological Society for 1849, p. lxxv, called attention to the fact that the genus *Anthophorabia* was identical with his *Melittobia*, described at the July meeting in 1847 ; that Mr. Newport was present at the said meeting, heard his description read and saw his types and drawings. He then follows with a full generic description.

Why this description was not published previously, in the Proceedings of the Society for 1847, I do not know, but I think all fair-minded persons will agree with me in believing that of the two names *Melittobia* should take precedence over *Anthophorabia*.

The genus is a peculiarly striking one in the great dissimilarity in the sexes. In the male the wings are rudimental or abbreviated, the eyes are reduced to a single ocellus and the antennal scape is strongly developed, gradually dilated and lobed at apex ; the flagellum is very short and twisted and capable of being folded beneath the dilated scape. The female, on the contrary, is fully-winged with normal eyes and antennæ.

This degraded male type is exceptional in the order Hymenoptera, as I am only aware of its occurrence among the fig insects, as Blastophagæ, although it is not unusual in Homoptera and possibly other orders.

Mr. Howard, in his generic synopsis of the Chalcididæ, has placed the genus in the sub-family Elachistinæ, following Thomson's classification, but it plainly does not belong here, agreeing in no essential character with this group. In all the essential characters, except in having two tibial spurs to the posterior legs, it agrees with the Tetrastichinæ: The submarginal vein is distinctly broken, the postmarginal undeveloped; the scutellum with two furrows, while the abdomen is sessile. I therefore propose to remove it to this group.

The first notice of the occurrence of the genus in America was by Dr. A. S. Packard, Jr., who in the Proceedings of the Essex Institute, Vol. IV, p. 13, described *Anthophorabia megachilis*, from the ♀ alone, obtained from the cells of *Megachile centuncularis* Linn, collected by Mr. Putnam at Bridgport, Vermont. Dr. Packard counted upwards of one hundred and fifty larvæ in a single cell.

In the Department Collection there is a single female specimen, agreeing tolerably well with Packard's species, reared by Dr. Riley, November 17, 1877, from the cells of *Anthophora abrupta* Say, collected in Carondelet, a suburb of St. Louis, Mo., which were also infested with a Meloid larva, *Hornia minutipennis* Riley, Dipterous larvæ and mites.

At Jacksonville, Fla., during the month of August, in 1887, I reared a species from the common mud wasp, *Pelopæus cementarius* Drury, to which I gave the MS. name *Melittobia pelopæi*; and Prof. E. A. Popenoe has reared a species at Manhattan, Kans., from the cells of the same insect.

Recently another species was handed me to be determined, reared in quantities from the cells of *Chalybion cæruleum* Linn., collected in Virginia, and which, as far as I can remember, is different from *Melittobia pelopæi*, Ashm., MS. This species I exhibit to-night in both sexes, and have drawn up a description of it under the name *Melittobia chalybii*. The larva of *Melittobia*, according to Newport, "is completely apodal, of a sub-cylindrical form, a little attenuated at each extremity, and composed of fourteen segments. The head is small, like that of a wasp or hornet, and the mandibles are short and acute. It occurred in the cells to the number of thirty or fifty in each. I found it not only in autumn, but also in the winter and early spring in this state, but in some cells the larvæ had changed to nymphs before the month of September." Mr. Newport then enters into a discussion of the habits of the insect, the structural characters of the males, etc., which is well worthy of

a repetition here. He says: "The habits of this insect may be inferred from the peculiar organization of the male. From both sexes being found in the closed cells of the bee, and from the absence of a long ovipositor in the female we may conclude that the eggs are deposited while the nest is being provisioned, or immediately before it is closed; and that, like the true Ichneumons, the parent either plunges her eggs into the body of the newly hatched bee-larva or attaches them to its skin. The bee-larva, like many other species similarly circumstanced, continues to feed and grow, and supply nourishment to the parasites; and by the time it has consumed the whole of its provision these also are far advanced in growth. When the young bee is entirely destroyed these are matured and prepared for their changes to the state of nymph, which they assume lying loosely in the cell, without spinning separate cocoons."

"From the circumstance that although both sexes are found moving freely in the cell, the male is by far the least active, and especially from the fact that his organs of vision are merely single ocelli, instead of large compound eyes, as in the other sex, I am led to the conclusion that impregnation is effected before the insects quit their habitation; because ocelli, being different in their structure from the individual parts of the compound eyes, are fitted only for near vision. The difference of structure consists in this: The cornea, or external surface of each part of the compound eye, which is individually as perfect, as an organ of vision, as the ocellus, or single eye, is less convex than the cornea of the latter; while the *chamber* of the eye, or space between the cornea and the termination of the nerve at the bottom of the structure, is of much greater length in the compound eye than in the single. The result of these two conditions is, that the compound eye is fitted for viewing objects at a considerable distance, but with little magnifying power; while the ocellus has great magnifying power, but is fitted only for viewing near objects. The male with his single eyes may thus be regarded as acute, but short-sighted, the opposite of his partner. But this condition is essential to him, and fully sufficient, if, as presumed, the greater portion of his existence is passed in a closed cell, not half an inch in diameter, and from which, perhaps, he never wanders more than to the distance of a few inches. But stemmata or ocelli only would be insufficient for the other sex, who has not only to seek out the proper locality for her eggs, but also to elude the vigilance of the bee in whose nest she is seeking to introduce her own progeny. Instead, therefore, of mere stemmata, the eyes of the female are multiplied, and occupy, as in most other perfect insects, a large portion of the surface on each side of the head."

Melittobia chalybii n. sp.

♀. Length $1\frac{1}{2}$ mm. Black, smooth, shining and pubescent; the pubescence of the thorax black, rest of the body grayish. Head transverse, thin antero-posteriorly; when viewed from in front, oval, the vertex being high and truncate; frons impressed or grooved for the reception of antennæ. Ocelli 3, triangularly arranged. Eyes narrow, pubescent. Antennæ short, 9-jointed, inserted just above the mouth, the scape and pedicel brownish-yellow, the flagellum fuscous, pubescent; the scape is subclavate, the flagellum, including the pedicel, is not longer than the scape. Pronotum large, narrowed anteriorly, triangular; mesonotum a little longer than wide, with two deep parapsidal furrows; scutellum with two deep parallel furrows, the lateral lobes appearing as if carinated; metathorax subquadrate, smooth, shining, with a very delicate or subobsolete medial keel, and the posterior lateral angles lobately produced. Wings gradually narrowed at base, hyaline, pubescent, except a glabrous line extending from the base along the posterior margin to nearly two-thirds the length of the wing; the submarginal vein is distinctly shorter than the marginal vein and distinctly fractured at its junction with the marginal; postmarginal not or scarcely developed, never half the length of the very short, knobbed stigmal vein. Legs brownish-yellow, very pubescent, all coxæ and femora, except the tips, black; tibial spurs 1, 2, 2, short and weak, the inner spurs being scarcely discernible; tarsi 4-jointed, much shorter than the tibiæ. Abdomen sessile, oblong-oval, a little longer than the head and thorax together, and its widest portion being twice as wide as the thorax.

The ♂ is but 1 mm. long and differs from the female in the following colorational and structural differences: The head and legs are pale, brownish-yellow, the scape reddish brown, dusky at tip, the thorax more or less piceous at the sides. The head, when viewed from in front, is transverse oval, being wider than long; the eyes are almost obsolete, being reduced to a single ocellus, while the ocelli are nearly in a straight line. The antennæ are 8-jointed; the scape is very large, gradually and broadly dilated toward the apex, with the sides curving under; above it is therefore convex while beneath it is concave with an apical process at tip within; the very short flagellum, which is not half the length of the scape, issues apparently from the emargination formed by this process, and is often peculiarly twisted backwards within the cavity; the pedicel and the first funicle joint are stout, about of an equal size, the three following joints are not so wide as the first, but are exceeding short and relatively thrice as wide as long, the club is stout and oblong, 3-jointed. The wings are abbreviated and reach scarcely to the middle of the abdomen.

Described from several specimens in both sexes, reared September 14 and 15, from cells of *Chalybion ceruleum*, Linn. Collected in Virginia.

In the discussion of this communication Mr. Howard stated that in his opinion Mr. Ashmead was correct in referring *Melittobia* to the Tetrastichinae, and called attention to the fact that if, as Mr. Ashmead seemed to suppose, this is a primary parasite on Bee larvæ, it offers a striking exception to the rule of hyper-parasitism in this sub-family. He further stated that the rearing of this genus from Aculeata which store pollen, in addition to those which store insects, eliminates one element in the determination of host habit which might otherwise be very confusing.

Dr. Marx presented the following paper :

NOTE ON THE CLASSIFICATION OF THE IXODIDÆ.

BY GEORGE MARX.

While many naturalists, even some of the present day, as Mégnin, Blanchard, Raillet and others maintain that the Ixodidæ comprise only the one genus *Ixodes* Latr., or in other words that all species of Ticks ought to be brought into this one solitary genus, C. Koch, on the other hand, recommended that the Ixodidæ should be separated from the order *Acari* and be elevated to the rank of a new order of *Arachnida*; this new order, which he calls *Ricini*, to be divided into separate families and numerous genera.

This great dissension of opinion is due, perhaps, to the fact that the former naturalists arrived at their conclusion by treating only the forms of their limited indigenous fauna, which consists principally of the species of the genus *Ixodes* Latr. Koch, on the contrary, acquired a broader and more general view of the group by studying material collected over the whole globe, which enabled him to observe forms that could not be placed in the narrow limits of one genus without utter disregard for the laws of classification; but he failed to show valid reasons for the separation of the *Ricini* from the other *Acari*, therefore I do not consider myself warranted in following him in this direction. Koch was, however, certainly right in dividing the heterogeneous material of his *Ricini* into different families and genera, especially as he also separated the *Argasidæ** from the *Gamasidæ* and brought them into the scope of his new group.

* Agassiz in his nomenclator substituted *Argantidæ* for *Argasidæ*, but claims that *Argas* is derived from the name of a *serpent*, the genitive of which is *Arg-o*—the family name accordingly should be *Arg-idæ*. For convenience and suitableness I have adopted the old name *Argasidæ* for this family.—G. M.